



This semester, we welcomed eight new graduate students. During their first semester, the new students will rotate through different labs before choosing which research group they will join. They are also diving head first into coursework and teaching laboratory sections. Welcome and keep up the good work!



*Emily Lahmayer,
Undergraduate
Coordinator*

We are also excited to welcome our new Undergraduate Coordinator, Emily Lahmayer. Emily was graduated from UWM in 2017 with a bachelor's degree in Global Studies.

New students, clockwise from upper left: Ethan Kub, Jonathan Mielke, Tye Seideman, Eron Saxon, Daniel Webb, Emily Bialka, Allison Tomczyk, Leah Johnson

From the Chair's Desk



Joe Aldstadt

And once again, it's that time of year for issuing our biannual newsletter, and we hope that it finds you well. We've had another busy semester as our programs continue to prosper. We welcomed Jarett Wilcoxon this semester, the newest addition to our faculty. Jarett's scholarly work is in inorganic chemistry and we have thus doubled the number of inorganic chemists in the department! Read more about Jarett on page 2.

For the design of our new building, we have been working closely with architects and engineers on the "Pre-Design" over the past five months, and a draft report is being prepared. Once it's approved, we'll move into more detailed designs of "prototypes" for classrooms as well as instructional and research labs, etc. You can read more about the New Building on page 4.

We also welcomed eight new graduate students this fall, bringing our total number to 76, with three post-docs and one visiting faculty. Along with our 300+ undergraduate majors, the department continues to thrive.

Our Holiday Party will be held on Friday, December 13th in Greene Hall, so mark your calendar & we hope to see you there. If you aren't able to attend, we hope you have a wonderful holiday season!

Sincerely,

Joe

New Faculty Jarett Wilcoxon



Casey, Oliver, and Jarett Wilcoxon

This August, we welcomed Dr. Jarett Wilcoxon to our faculty.

Jarett joins us as a tenure-track Assistant Professor, and his teaching and research interests focus at the interface of Inorganic Chemistry and Biochemistry. Jarett completed his Ph.D. in Russ Hille's group at the University of California-Riverside, and then moved to David Britt's group at University of California-Davis as a post-doctoral fellow. At UC-Davis, his studies focused upon the application of Electron Paramagnetic Resonance (EPR) spectroscopy to better understand metalloenzymes, inorganic complexes, and nitroxide spin labels.

He describes the program he is establishing here at UWM as: "We'll examine the structure-function relationship of metalloenzymes using biochemical and biophysical tools. We will explore, on a molecular level, how metalloenzymes generate highly reactive species, direct the reaction coordinate, and prevent unwanted side reactions. Researchers will develop skills in protein expression and purification, air-free techniques with biological samples, and spectroscopic techniques such as UV-VIS and EPR spectroscopy."

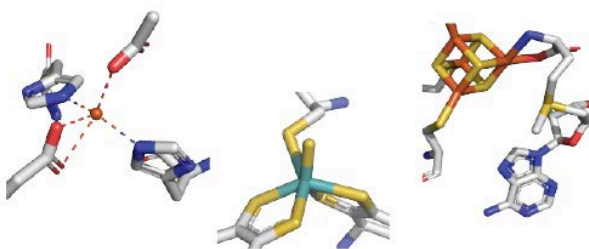
This semester, Jarett is teaching CHEM 311 "Introduction to Inorganic Chemistry" as well as setting up his laboratory, and we look forward to the exciting areas of scholarship that Jarett adds to our department as well as his eventual conversion from avid Dodgers fan to devoted Brewers fan.

Save the Date

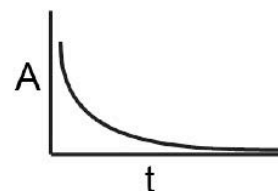
On Friday, December 13th the Department will hold its annual Holiday Gathering. You are invited to join us from 5:00 PM to 9:00 PM in Greene Hall.

Wilcoxon Lab

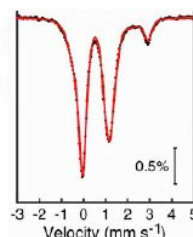
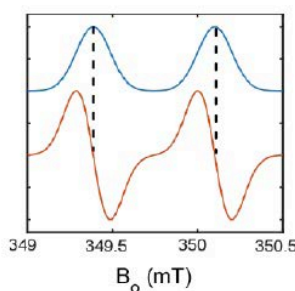
Metalloenzymology



Kinetics

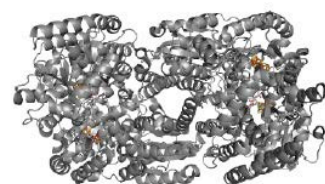


EPR



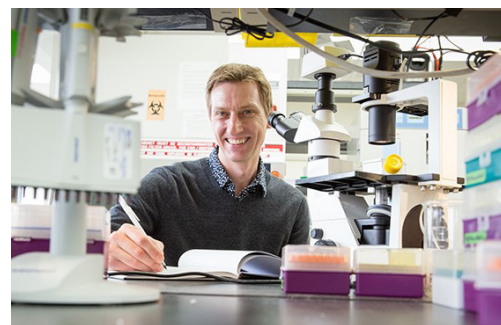
Mossbauer

Crystallography



Pantherics receives a Phase I NIH STTR grant

Pantherics Incorporated received a \$224,756 Phase I Small Business Technology Transfer (STTR) grant to advance research on a fundamentally novel asthma control drug. The first-in-class drug, MIDD0301, was discovered by researchers at the Milwaukee Institute for Drug Discovery and Columbia University (NY). The STTR grant will fund studies to optimize the compound's synthesis and formulation, key steps before it can advance to human clinical testing.



Dr. Alexander Arnold, Assoc. Professor in the Department, leads a multidisciplinary research team that has worked over the past several years to develop MIDD0301. He is Principal Investigator for the STTR grant, a Pantherics' co-founder, and its Chief Scientific Officer. He comments that "MIDD0301 is an exciting new approach to control asthma symptoms without the adverse effects of steroids and improperly used inhalers. A key innovation is our discovery of a single drug compound that effectively suppresses lung inflammation and relaxes bronchoconstriction, two hallmarks of clinical asthma."

The STTR is a highly-competitive grant program that reserves a percentage of federal R&D funding for awards that link US small businesses with nonprofit research institutions. Here, Pantherics formed a collaborative research arrangement with UW-Milwaukee and Dr. James Cook, whose MIDD medicinal chemistry laboratory first synthesized MIDD0301. Pantherics also has independent research laboratories at UWM. For more information on Pantherics, visit www.pantherics.com.

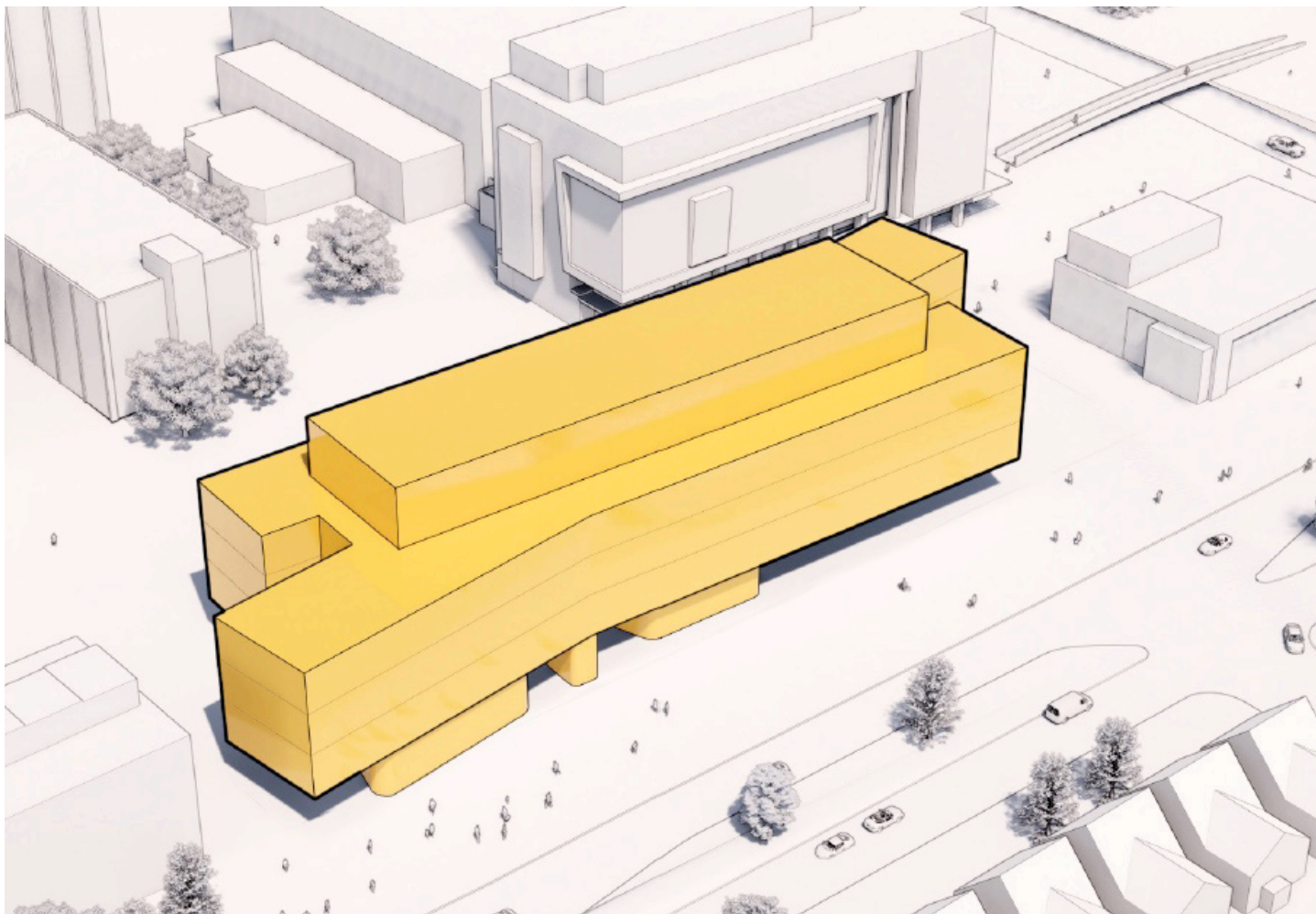


Spring 2019 Doctoral Degrees

- **Ali Ihsan Altan;** "In-Situ Chemical Probing of Vacancy Defects in Graphene and Boron Nitride at Room Temperature"
Major Professor: Jian Chen
- **Rajwana Jahan;** "Design and Synthesis of New Asthma Drugs by Targeting GABAA Receptors in the Lung"
Major Professor: James Cook
- **Joseph T. Labeots;** "A Real-time Approach to Process Monitoring of Heavy Metals: Spectrophotometric Characterization and Application of Novel Azo Dyes"
Major Professors: Joseph Aldstadt and Alan Schwabacher
- **Guanguan Li;** "Design and Synthesis of Achiral and Chiral Imidazodiazepine (IMDZ) GABA(A)R Subtype Selective Ligands for the Treatment of CNS Disorders as well as Asthma"
Major Professor: James Cook
- **Adebola Olatunji Oyefusi;** "Active Polymeric Material for 3D Shaping and Sensing"
Major Professor: Jian Chen
- **Olivia Brooke Yu;** "An Investigation of Calcitroic Acid and Its Phase Two Conjugates"
Major Professor: Alexander Arnold
- **Tyler G. Fenske;** "Molecular Recognition: β -Sheet Mimicry and Metal Ion Detection"
Major Professor: Alan Schwabacher

New Chemistry Building Update

Initial Conceptual Design



The design of the New Chemistry Building, for which funding was approved in July (\$129M), is underway. The university contracted a team of architectural firms (Cannon Design & Kahler-Slater) and we have been working with them over the past five months to provide our perspective as the “User Group”.

The building will be located along Kenwood Boulevard, between the (old) Physics Building and the (new) Lubar Entrepreneurship Center. Our current building is slated for demolition to create “green space” between the new structure and Engelmann Field. Current plans call for a four-story structure, with two large lecture halls as well as an Outreach/Studio Lab and Tutoring/Supplemental Instruction rooms on the first floor. Instructional labs and small classrooms will be located on the second floor, with a combination of research labs and offices on the upper floors.

Doug Stafford Receives Award at 2019 Fall Awards Ceremony

Doug Stafford, Director of the Milwaukee Institute for Drug Discovery (MIDD) since 2010, received the UWM Academic Staff Outstanding Performance & Service Award during the 2019 Fall Awards Ceremony on October 16th, 2019. Since his hire as director of the MIDD, Douglas Stafford has helped connect companies to UWM research, supported UWM faculty startups, and set in motion plans for drug discovery facilities that will benefit the Department of Chemistry for years to come.



When the state committed funds to establish a center of applied and analytical chemistry at UWM in 2013, Stafford secured matching funds to include a state-of-the-art mass spectrometry lab in the Kenwood Interdisciplinary Research Complex that has attracted many business partners.

With grant-writing skills that one nominator called “phenomenal,” Stafford has helped obtain federal funding for a wide variety of MIDD-member projects, addressing diseases such as asthma, neuropathic pain and cancer.

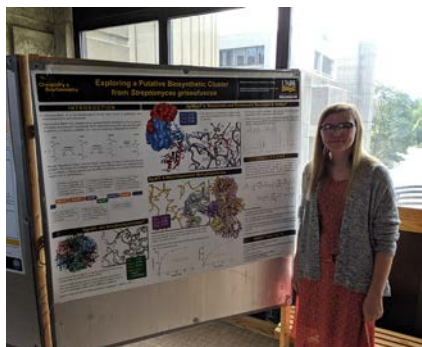
Says Brian Thompson, president of the UWM Research Foundation: “Doug has been successful in helping other researchers achieve their fullest potential with his skills in building partnerships, providing advice and support on intellectual property protection, and supporting key negotiation discussions – all informed by his knowledge of industry.”

Department in the News

- November 11th, 2019: Chemistry Alum Rebecca Patterson is featured in the [UWM Report](#).
- July 27th, 2019: Arnold Group's work on Asthma makes the front page of the [Milwaukee Journal Sentinel](#).
- June 13th, 2019: The chemistry building and UW System budget approval is featured in an article in [Urban Milwaukee](#).
- June 11th, 2019: The current chemistry building is featured in an article in the [Milwaukee Journal Sentinel](#).

Summer 2019 Undergraduate Research Program

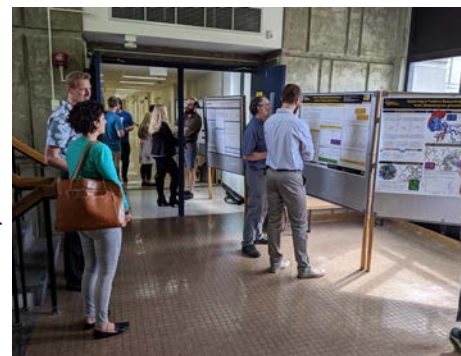
Fourteen undergraduate students participated in the 2019 SURF program. They worked in nine different research laboratories in the Department of Chemistry and Biochemistry. Over a period of three summer months, they learned how to conduct research and were introduced to the ongoing scientific research and expectations of UWM graduate students. At the end of the program, most of the students presented their work in the form of a poster and summarized their work in a written report. Many of these results will be parts of future publications.



Madeline Rettmann

As a group, students visited MilliporeSigma in Sheboygan, Wisconsin. The company just merged with Merck KGaA, a company with headquarter in Darmstadt and one of the largest producers of chemicals in the world. At the Sheboygan facility, many valuable chemicals are produced that include Stains & Dyes and Flavors & Fragrances. Director Dr. Rob Thomas gave a great presentation, which was followed by visiting several labs at the Sheboygan site.

In August, the best poster was presented by Madeline Rettmann, who worked in the laboratory of Prof. Silvaggi. The title of her poster was: "Exploring a putative biosynthetic cluster from *Streptomyces griseofuscus*." The second best poster was presented by Lexie Lanphere, who worked in the group of Prof. Aldstadt. The title of her poster was: "Development of novel approaches to determine designer amphetamines in confiscated forensic samples." The third best poster was presented by Dante Serrano, who also worked in the laboratory of Prof. Silvaggi. The title of his presented poster was: "Towards a mass spectrometry-based arginine oxidase activity assay."



Undergraduate Students from Mirza Lab Pursuing Higher Studies

Marwat Salamin and Petra Stevanovic worked over a year in the Mirza lab as undergraduate student researchers. Marwat is a biochemistry major and Petra is a biological sciences major with a minor in chemistry. During their tenure in the Mirza lab, they took on a challenging project to identify the elemental biomarkers of Ureteropelvic Junction Obstruction (UPJO) in pediatric patients. Their research was supported by a grant from UWM's Office of Undergraduate Research (OUR) through their Support for Undergraduate Research Fellows (SURF) program and also by the National Institutes of Health (NIH).

UPJO is a blockage of the kidneys and is the major cause of kidney failure in infants, affecting about 1 in 1,500 newborns. Early diagnosis and treatment of UPJO have been proven to increase prognosis and kidney function. The disease is currently diagnosed using highly invasive, time-consuming, and expensive options such as radiological analysis and tissue-biopsy. The goal of their research was to lead the pathway towards developing a simple, time- and cost-effective noninvasive method of diagnosis. With that goal, they analyzed urine samples from pediatric patients for elemental biomarkers using inductively coupled plas-



Petra Stevanovic

trometry (ICP-MS). Preliminary studies from their research identified nine elements to have differences in UPJO samples compared to normal controls. Marwat and Petra presented their findings at the Summer 2018 SURF Poster Presentations and at the Milwaukee Analytical Chemistry Conference (MACC) in 2019 and won the best poster award at both conferences. While in the Mirza lab, Marwat received the 'Outstanding Performance in Biochemistry Award' during the Annual Departmental Awards Day in May 2019. This fall, Marwat enrolled in the Doctor of Medicine (MD) program at the University of Wisconsin-Madison School of Medicine and Public Health, and Petra enrolled in the Doctor of Pharmacy (PharmD) program at the Medical College of Wisconsin School of Pharmacy.



"I'm truly grateful for being given the opportunity to work with highly advanced, state-of-the-art lab equipment like the ICP-MS," Petra said. "Doing research in Dr. Mirza's lab provided me with valuable hands-on experience when it came to applying my scientific knowledge, and expanding it a step further through designing, as well as conducting experimental trials. The skills I acquired through the Shimadzu Lab are the skills that will indefinitely aid in my future career as a pharmacist."

Marwat said, "I was always interested in going to medical school, but I did not know what I wanted to do as an undergraduate. After taking various chemistry courses I fell in love with the field. Joining a research lab played an important role in determining my career choices. I wasn't sure if I should continue to do research or pursue a career in clinical medicine. However, working in Dr. Mirza's lab exposed me to a field that integrated both clinical medicine and research. While I learned about the physical presentation of UPJO, I was able to rationalize such presentations with analytical methods. Mirza lab helped me gain critical thinking skills and expanded my understanding of analytical method development and optimization. As an undergraduate, it was a privilege to learn how to use an ICP-MS. Working with such an instrument developed my skills in critical analysis and problem solving. Due to my research experience, I am hoping to pursue a career in renal medicine while continuing my work in analytical chemistry research".

Both Marwat and Petra hope to continue research initiatives along with their professional career for the better understanding of diseases and provide quality care to the patients.

Friends of Chemistry

Your contributions enhance the educational experience of our students and strengthen the research and development of our faculty and staff. Please join us in thanking our friends. (Gifts were received from March 2019 to November 2019.)

Chemistry General Fund

- Mrs. Shirley McLean
- Mrs. Jahanna Vanselow
- Mr. Thomas G. Kottke
- Mr. Michael J. Martin

George Keulks Memorial Fund

- Mr. Lixun Zhang
- Dr. David Krenzke

For more information on becoming a Friend of Chemistry and Biochemistry, please see the pledge form on the back, visit our website www.uwm.edu/chemistry/give, or contact Leslie Horn at 414-229-3294 or e-mail her at lahorn@uwm.edu.



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